UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

October 29, 2010

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT 05000280/2010004, 05000281/2010004, 05000280/2010501 and 05000281/2010501.

Dear Mr. Heacock:

On September 30, 2010, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on October 14, 2010, with Mr. Sloane and other members of your staff.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, no findings of significance were identified. However, one licensee-identified violation which was determined to be of very low safety significance is listed in this report. NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy because of the very low safety significance of the violation and because it is entered into your corrective action program. If you contest any NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Surry Power Station.

In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II; and the NRC Resident Inspector at the Surry Power Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-280, 50-281
License Nos.: DPR-32, DPR-37

Enclosure: Inspection Report 05000280/2010004, 05000281/2010004, 05000280/2010501 and 05000281/2010501.
w/Attachment: Supplemental Information

cc w/encl. (See page 3)

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Letter to David A. Heacock from Gerald J. McCoy dated October 29, 2010

SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT 05000280/2010004, 05000281/2010004, 05000280/2010501 and 05000281/2010501.

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REGION II

Docket Nos.:	50-280, 50-281
License Nos.:	DPR-32, DPR-37
Report No:	05000280/2010004, 05000281/2010004, 05000280/2010501 and 05000281/2010501.
Licensee:	Virginia Electric and Power Company (VEPCO)
Facility:	Surry Power Station, Units 1 and 2
Location:	5850 Hog Island Road Surry, VA 23883
Dates:	July 1, 2010 through September 30, 2010
Inspectors:	C. Welch, Senior Resident Inspector J. Nadel, Resident Inspector L. Miller, Senior EP Inspector, Sections 1EP4, 1EP5, and 4OA5 J. Beavers, EP Inspector, Sections 1EP2, 1EP3, and 4OA1 J. Dodson, Senior Project Engineer
Approved by:	Gerald J. McCoy, Chief Reactor Projects Branch 5 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000280/2010004, 05000281/2010004, 05000280/2010501, and 05000281/2010501; 07/01/2010 – 09/30/2010; Surry Power Station, Units 1 and 2, Routine Integrated Inspection Report

The report covered a 3 month period of inspection by resident inspectors and an announced emergency preparedness inspection by regional specialists. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspect was determined using IMC 0310, "Components Within The Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4, dated December 2006.

NRC Identified and Self-Revealing Findings

None

Licensee Identified Violations

A violation of very low safety significance that was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near full rated thermal power (RTP) throughout the inspection period.

Unit 2 entered the period at full power. A forced outage was conducted from July 11 – 13 to repair a non-isolable leak in the circulating water pipe supplying the 2A condenser water box. The reactor was brought critical following the repair on July 13, however due to a voltage spike on the main generator during trouble shooting of its voltage regulator, the reactor was shut down on July 14 to inspect the Unit 2 main and station service transformers. The reactor was taken critical at 1:21 am on July 16 and the unit was later re-connected to the electrical grid. Full power was obtained the morning of July 17 and maintained until August 28 when power was reduced to 84% due to degrading condenser vacuum. The condition was promptly corrected and full power was restored for the remainder of the inspection period.

REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

.1 Site Specific Weather

a. Inspection Scope

In response to hurricane Earl, the inspectors reviewed the licensee's preparations for potential severe weather as well as severe weather procedures Operations Check List (OC) 21, "Severe Weather," and 0-AP-37.01, "Abnormal Environmental Conditions." The inspectors walked down site areas which included the electrical switchyard, emergency diesel generators, alternate AC (AAC) diesel generator, emergency switchgear rooms, emergency service water pump house, and the turbine, safeguards, and auxiliary buildings. During the walkdown, the inspectors looked for loose items and or debris that could become a missile hazard during high winds, verified flooding barriers were available and / or in place, and verified that the emergency equipment was available and in the required standby mode. The inspectors were on-site during the storm's passage on Friday, September 3.

b. Findings

No findings were identified.

.2 External Flooding

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report and station procedures for severe weather involving external flooding to evaluate the station's readiness to cope with external flooding at the intake structure. The inspectors reviewed

elevation drawings for the emergency service water (ESW) pump house and walked down the intake structure to assess the structures water tightness, the readiness of personnel to respond to hurricane Earl in order to protect the ESW pump house from flooding, as well as the condition and availability of the buildings' removable flood barriers. The inspectors reviewed the corrective action program to verify the licensee was identifying weather related problems and entering the issues into the corrective action program.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed a partial walk down on the four risk-significant systems identified below to verify the redundant or diverse train for equipment removed from service was operable and/or that the system had been properly aligned to perform its designated safety function following an extended outage. During the walkdown, the inspectors verified the positions of critical valves, breakers, and control switches by in-field observation and/or review of the main control board. To determine the correct configuration to support system operation, the inspectors reviewed applicable operating procedures, station drawings, the Updated Final Safety Analysis Report, and the Technical Specifications. During the walkdown, the inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk.

- The emergency ventilation A train (1-VS-F-58A) during planned maintenance on the B train (1-VS-F-58B).
- The motor driven fire pump during testing of the diesel driven fire pump.
- Unit 2 motor driven auxiliary feedwater trains during planned maintenance on the turbine driven auxiliary feedwater pump.
- The B service water header supply via 1-VS-S-1B during planned maintenance on 1-VS-S-1A and the associated MER 3 piping.

b. Findings

No findings were identified.

.2 Full System Review

a. Inspection Scope

The inspectors performed a full system review and walkdown of the Unit 1 and Unit 2 Main Control Room and Emergency Switchgear Room HVAC systems to verify the systems were properly aligned and capable of performing their safety function, and to assess their material condition. During the walkdown, the inspectors verified breaker positions were in the proper alignment, component labeling was accurate, hangers and supports were functional, and local indications were accurate. Recent testing history was also reviewed to verify that standby components were performing within their design. The plant health report, system drawings, condition reports, the UFSAR, and Technical Specifications were reviewed and outstanding deficiencies were verified to be properly classified and not affect system operability and capability to perform its safety function. The inspectors reviewed the corrective action program to verify equipment alignment issues were being identified and resolved.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Quarterly Fire Protection Reviews

a. Inspection Scope

The inspectors conducted a defense-in-depth (DID) review for the seven fire areas listed below by walkdown and review of licensee documents. The reviews were performed to evaluate the fire protection program operational status and material condition and the adequacy of: (1) control of transient combustibles and ignition sources; (2) fire detection and suppression capability; (3) passive fire protection features; (4) compensatory measures established for out-of-service, degraded or inoperable fire protection equipment, systems, or features; and (5) procedures, equipment, fire barriers, and systems so that post-fire capability to safely shutdown the plant is ensured. The inspectors reviewed the corrective action program to verify fire protection deficiencies were being identified and properly resolved.

- Fire zone 64, Black Battery House
- Intake Vacuum Priming House
- Fire Zone 52, Unit 1 High Level Intake Control House
- Fire Zone 53, Unit 2 High Level Intake Control House
- Fire zone 48, Screenwell Transformers
- Fire zone Z28B, Intake Structure – Emergency Service Water Pumps
- Fire zone Z28C, Intake Structure - Oil tank Room

b. Findings

No findings were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed the internal flood protection measures and procedural controls established to address potential flooding in the Unit 1 and 2 turbine buildings, the emergency switchgear rooms, and mechanical equipment rooms (MER) 3 and 4 during ongoing work to repair a non-isolable leak in the 96 inch diameter circulating water supply line to the Unit 2 main condenser 2A water box and for replacement of the piping expansion joint 2-SW-REJ-202B located in the 10 inch service water line. The inspectors conducted a walk down of the affected areas to observe and assess the condition of the installed flood dikes, floor drain backflow preventers, the sealing of holes and penetrations between flood areas, the adequacy of water tight doors, and the operability of flooding alarms and the installed sump pumps. The inspectors reviewed the corrective action program and verified internal flooding related problems were being identified and properly addressed.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors observed an evaluated licensed operator simulator exercise given on September 14, 2010 using scenario RQ-10.7-SP-1, Rev. 0. The scenario involved both operational transients and design basis events. The inspector verified that simulator conditions were consistent with the scenario and reflected the actual plant configuration (i.e., simulator fidelity). The inspector observed the crew's performance to determine whether the crew met the scenario objectives; accomplished the critical tasks; demonstrated the ability to take timely action in a safe direction and to prioritize, interpret, and verify alarms; demonstrated proper use of alarm response, abnormal, and emergency operating procedures; demonstrated proper command and control; communicated effectively; and appropriately classified events per the emergency plan. The inspector observed the evaluators' post scenario critique and confirmed items for improvement were identified and discussed with the operators to further enhance performance.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the two equipment issues described in the condition reports listed below, the inspectors evaluated the effectiveness of the corresponding licensee's preventive and corrective maintenance. The inspectors performed a detailed review of the problem history and associated circumstances, evaluated the extent of condition reviews, as required, and reviewed the generic implications of the equipment and/or work practice problem(s). Inspectors performed walkdowns of the accessible portions of the system, performed in-office reviews of procedures and evaluations, and held discussions with system engineers. The inspectors compared the licensee's actions with the requirements of the Maintenance Rule (10 CFR 50.65), station procedures ER-AA-MRL-10, Rev. 4, "Maintenance Rule Program;" and ER-AA-MRL-100, Rev. 1, "Implementing the Maintenance Rule;" the Surry Maintenance Rule Scoping and Performance Matrix. And industry guidance contained in NUMARC 93-01, Rev. 2, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

- CR 388265, ESW Pump 1B High Engine Temperature.
- CR 389110, EDG #3 Failed to Start.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, for the five work activities listed below: (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and, (4) that maintenance risk assessments and emergent work problems were adequately identified and resolved. The inspectors verified that the licensee was complying with the requirements of 10 CFR 50.65(a)(4) and the data output from the licensee's safety monitor associated with the risk profile of Units 1 and 2. The inspectors reviewed the corrective action program to verify deficiencies in risk assessments were being identified and properly resolved.

- On-line green risk condition for Units 1 and 2 on August 11associated with planned maintenance and emergent work on Unit 2 due to component failures in the reactor protection circuits for the overpower delta temperature (OPDT) instrument and reactor coolant pump (RCP) under voltage .
- On-line elevated risk (yellow) condition for Units 1 and 2 on August 13 associated with planned maintenance and emergent work to replace the failed reactor coolant pump (RCP) under voltage reactor protection relay on Unit 2.

- On-line green risk condition for Units 1 and 2 on July 20 associated with the removal of Circulating Water Piping missile shields.
- On-line green risk condition for Unit 1 on August 6 associated with the operations surveillance test of the 3A motor driven auxiliary feedwater pump which was terminated after starting the test.
- On-line green risk condition for Units 1 and 2 on August 24 associated with a planned entry into a 24-hour shutdown TS LCO for the isolation of the B header of service water for cleaning and inspection coincident with filter testing of the Auxiliary Building Emergency Exhaust fans.

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the three operability evaluations listed below, affecting risk-significant mitigating systems, to assess as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether other existing degraded conditions were considered; (4) if compensatory measures were involved, whether the compensatory measures were in place, would work as intended, and were appropriately controlled; and (5) where continued operability was considered unjustified, the impact on TS Limiting Conditions for Operation and the risk significance. The inspectors' review included verification that determinations of operability followed procedural requirements of OP-AA-102, "Operability Determination." The inspectors reviewed the corrective action program to verify deficiencies in operability determinations were being identified and corrected.

- CR 388265, 1-SW-P-1B in Alert for high engine temperature.
- CR 389798, explosive mixture in pressurizer relief tank.
- CR 386255, Unit 2 cable spreading room fire penetration 1-FP-PEN-2534 has a gap.

b. Findings:

No findings were identified.

1R18 Plant Modifications

a. Inspection Scope

Reviews of risk significant on-line plant modifications, identified below, were conducted to verify: (1) that the design and licensing bases, and performance capability of risk-significant systems, structures, and components (SSCs) were not degraded through modification; (2) that modifications performed during increased risk-significant

configurations do not place the plant in an unsafe condition; and, (3) that the modification did not affect system operability or functionality as described in the TS and UFSAR. The inspection was accomplished by review of: engineering evaluations, the modification design and implementation packages and associated work orders, drawings, corrective action documents, supporting analyses, the UFSAR and TS, applicable procedures, and design basis information. Observation of various aspects of the implementation of the modification and post-modification testing were observed and or reviewed by the inspectors.

- Component equivalency and modification ET-S-10-0060, Rev. 1; "Assembly, Testing, and Installation for 0.22 microfarad and 150 ohm RC Filter."
- Temporary Modification S-2-10-080 Rev 0, installation/removal of electrical jumpers needed to facilitate replacement of RCP UV relay 2-RP-RLY-271-XB.

b. Findings:

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

For the seven risk-significant maintenance activities listed below, the inspectors reviewed the associated post maintenance testing (PMT) procedures and either witnessed the testing and/or reviewed completed records to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) test acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) test were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and (8) equipment was returned to the status required to perform its safety function. The inspectors reviewed the corrective action program to verify PMT deficiencies were being identified and corrected. Documents reviewed are listed in the Attachment.

- W.O. 38102836359, investigate/replace failed OP set point indication (2-RC-TM-2422B).
- W.O. 38076008901, preventive maintenance replacement of expansion joint 2-SW-REJ-202B.
- Replacement of resistor-capacitor (RC) filters replaced in the Unit 1 Nuclear Instrumentation Cabinets.
- W.O. 38102835947, replacement of Unit 2 "A" reactor coolant pump under voltage relay (2-RP-RLY-271-XB).
- W.O. 38102827974, replacement of start failure relay in start circuit number 1 for EDG #3

- W.O. 38102140934, planned maintenance on the breaker for Unit 1 Service Water Charging Pump P-10A
- W.O. 38102671689, testing of Unit 1 and Unit 2 Cable Vault Backflow Preventers

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

.1 Unit 2 Forced Outage

a. Inspection Scope

The inspectors, on a sampling basis, verified Technical Specification (TS) requirements for applicable mode changes were met, plant risk assessments were accurate, and that cool down and heat up limits were observed, during the forced outage conducted from July 11 - 16, 2010. The inspectors reviewed licensee calculations for shutdown margin and the estimated position for criticality and compared results against independent calculations performed by the inspector. Control room evolutions to startup and place the Unit on-line were observed by the inspectors. No work was performed in containment during the forced outage.

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors witnessed and/or reviewed test records for the eight risk-significant surveillance tests listed below, to determine the SSCs' operational readiness and whether the SSCs selected meet the Technical Specifications (TS), Updated Final Safety Analysis Report (UFSAR), and licensee's procedure requirements and if the test adequately demonstrated that the SSCs are capable of performing their intended safety functions (under conditions as close as practical to accident conditions or as required by TS).

In-Service Testing:

- 1-OPT-CH-002, Rev. 47; Charging Pump Operability and Performance Test for 1-CH-P-1B.
- 1-NPT-CW-001, Rev. 3, Inservice Inspection and System Pressure Test of 96 inch Circulating Water Piping.

Surveillance Testing:
- 2-PT-8.1, Rev. 32; Reactor Protection System Logic (For Normal Operations)
- 2-OPT-EG-001, Rev. 54; Number 2 Emergency Diesel Generator Monthly Start Exercise Test.
- 1-NPT-RX-002, Rev. 23, Unit 1 Flux Map
- 0-NSP-CW-001, Rev. 10, High Level Intake Structure Canal Level Probes Cleaning

RCS Leak Rate Determination
- 1-OPT-RC-10.0, Rev. 34, Reactor Coolant Leakage – Computer Calculated
- 2-OPT-RC-10.0, Rev. 33, Reactor Coolant Leakage – Computer Calculated

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System Testing

a. Inspection Scope

The inspector evaluated the adequacy of licensee's methods for testing the alert and notification system in accordance with NRC Inspection Procedure 71114, Attachment 02, "Alert and Notification System Evaluation". The applicable planning standard 10 CFR Part 50.47(b)(5) and its related 10 CFR Part 50, Appendix E, Section IV.D requirements were used as reference criteria. The criteria contained in NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, was also used as a reference.

The inspector reviewed various documents which are listed in the Attachment. This inspection activity satisfied one inspection sample for the alert and notification system on a biennial basis.

b. Findings

No findings were identified.

1EP3 Emergency Preparedness Organization Staffing and Augmentation System

a. Inspection Scope

The inspector reviewed the licensee's Emergency Response Organization (ERO) augmentation staffing requirements and process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. The qualification records of key position ERO personnel were reviewed to ensure all ERO qualifications were current. A sample of problems identified from augmentation drills or

system tests performed since the last inspection were reviewed to assess the effectiveness of corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, "Emergency Response Organization Staffing and Augmentation System." The applicable planning standard, 10 CFR 50.47(b)(2) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspector reviewed various documents which are listed in the Attachment. This inspection activity satisfied one inspection sample for the ERO staffing and augmentation system on a biennial basis.

b. Findings

The licensee identified a finding of very low significance. The enforcement aspects of this finding are discussed is Section 4OA7.

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, no change has been implemented to Revision 54 of the Radiological Emergency Response Plan. The inspector conducted a sampling review of the Plan changes and implementing procedure changes made between August 1, 2009, and August 31, 2010 to evaluate for potential decreases in effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, "Emergency Action Level and Emergency Plan Changes." The applicable planning standard (PS), 10 CFR 50.47(b)(4) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspector reviewed various documents which are listed in the Attachment. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

b. Findings

No findings were identified.

1EP5 Correction of Emergency Preparedness Weaknesses

a. Inspection Scope

The inspector reviewed the corrective actions identified through the Emergency Preparedness program to determine the significance of the issues and to determine if

repeat problems were occurring. The facility's self-assessments and audits were reviewed to assess the licensee's ability to be self-critical, thus avoiding complacency and degradation of their emergency preparedness program. In addition, the inspector reviewed licensee self-assessments and audits to assess the completeness and effectiveness of all emergency preparedness related corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 05, "Correction of Emergency Preparedness Weaknesses." The applicable planning standard, 10 CFR 50.47(b)(14) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspector reviewed various documents which are listed in the Attachment. This inspection activity satisfied one inspection sample for the correction of emergency preparedness weaknesses on a biennial basis.

b. Findings

No findings were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspector observed operator simulator training conducted on September 14, 2010, to assess licensee performance in the risk significant performance standards of emergency classification, protective action recommendations, and off-site notification. This drill evaluation is included in the Emergency Response Performance Indicator statistics.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Mitigating System Performance Index

a. Inspection Scope

The inspectors reviewed, on a sampling basis, the Mitigating System Performance Index (MSPI) performance indicators (PI) for Unit 1 and 2 for the third quarter 2008 through the second quarter 2010. The purpose of the review was to assess the accuracy and completeness of the submitted PI data and whether the performance indicators were calculated in accordance with the guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline." Inspection included review of the licensee's MSPI basis document, submitted PI data, PI work sheets, licensee event

reports (LERs), operator logs, condition reports, plant health reports and NRC inspection reports. The inspection covered the four Mitigating System Cornerstone performance indicators below:

- Unit 1 and 2 Emergency AC Power (EDG)
- Unit 1 and 2 Heat Removal System (AFW)

b. Findings

No findings were identified.

.2 Emergency Preparedness

a. Inspection Scope

The inspector sampled licensee submittals relative to the PIs listed below for the period July 1, 2009, and June 30, 2010. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used to confirm the reporting basis for each data element.

- Emergency Response Organization Drill/Exercise Performance
- ERO Drill Participation
- Alert and Notification System Reliability

For the specified review period, the inspector examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. The inspector verified the accuracy of the PI for ERO drill and exercise performance through review of a sample of drill and event records. The inspector reviewed selected training records to verify the accuracy of the PI for ERO drill participation for personnel assigned to key positions in the ERO. The inspector verified the accuracy of the PI for alert and notification system reliability through review of a sample of the licensee's records of periodic system tests. The inspector also interviewed the licensee personnel who were responsible for collecting and evaluating the PI data. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems

.1 Daily Reviews of items Entered into the Corrective Action Program:

As required by NRC Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human

performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished by reviewing daily CR report summaries and periodically attending daily CR Review Team meetings.

.2 Annual Samples - EDG #1 Failed to Start During Testing (CR 374103)

a. Inspection Scope

Based on risk significance of the Emergency A/C Power Systems and evidence of an adverse trend associated with fail-to-start and fail-to-load events for all three emergency diesel generators and the station blackout diesel generator, CR 374103 and its associated corrective actions were selected for follow-up. The inspectors reviewed the CR and CAs against the applicable performance attributes contained in NRC inspection procedure 71152, "Problem Identification and Resolution."

b. Findings and Observations

The inspectors identified an extensive history of similar documented events, where the EDGs failed-to-start during testing, that dated back 12 years. Documented troubleshooting and cause analyses performed for each event were often sparse and lacking rigor which made assessing effectiveness of the licensee's prior corrective actions difficult, if not impossible, to determine. The inspector, however, noted following a fail-to-start event in 2001 (S-2001-3453) on the No. 2 EDG, the licensee identified that critical relays in the EDG's starting circuits had never been replaced in 30 years of service. A corrective action was created to institute a replacement PM, on a 12-year frequency, of all critical relays in each EDG. For reasons that remain unclear, the PM was not created and entered into the PM tracking system until 2 years later in 2003. Procurement and engineering issues resulted in further delays and in 2008 a PM deferral (S-DEF-2008-0071) re-scheduled the relay replacements to coincide with pre-planned EDG maintenance packages from 2008 through 2014. In March 2010, the No. 1 EDG failed to start during surveillance testing (CR 374103). The root cause team was not able to establish a definitive cause for the start failure and could not rule out intermittent failure or faulty actuation of one or more relays in the start circuit; of those relays, several were original equipment, which had not yet been replaced in accordance with the established PM that was recommended in 2000. The suspect components in EDG #1 that could not be ruled out by the root cause team were replaced as well as the remaining legacy relays present in both start circuits. Though some remain, the licensee has replaced the majority of legacy relays in the other two EDGs.

4OA3 Event Follow-up

.1 (Closed) LER 05000280/2010-003-00, Loss of Vital Bus Due to Human Error results in Automatic Reactor Trip.

On June 8, 2010 the Unit 1 120 VAC Vital Bus 1-III was lost when the uninterruptible power supply (UPS) VB 1-A2 static switch swapped from the inverter to the Regulating Line Conditioner (RLC) (the alternate AC power source), which was tagged out for on-going maintenance. The static switch from the inverter swapped because a worker

dropped an energized lead during the maintenance. In response to the loss of the vital bus an automatic reactor trip occurred on Unit 1 from 100% power which was followed by a subsequent automatic safety injection. Additionally, a small fire, which was promptly extinguished, broke out in the nuclear instrumentation cabinet within the main control room when an electrical RC filter failed. The inspectors reviewed the LER for accuracy, adequacy of corrective actions, and violation of NRC requirements. Details of the event and associated inspection findings are provided in the NRC Special Inspection Team (SIT) inspection report, IR 05000280/2010006. This LER is closed.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with the licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings were identified.

.2 (Closed) URI 05000280, 281/2009007-02, "Availability of Portable Ventilation Fans for Use by the Fire Brigade."

a. Inspection Scope

As described in Unresolved Item (URI) 05000280, 281/2009007-02, the inspectors identified issues related to the availability of portable ventilation fans for use by the fire brigade. The inspectors performed an extensive review of the licensee's fire protection program procedures, records of completed drills, and corrective actions relating to the issues identified by the inspectors.

b. Findings and Observations

NFPA 27-1975, Section 72, "Equipment Storage," states that storage space for the brigade equipment should be provided so that it can be promptly obtained for use and be properly maintained. The licensee committed to NFPA 27-1975 in their fire protection plan (FPP).

Portable ventilation fans are needed at Surry because no special smoke exhausting systems are installed at the plant. This condition was recognized in the SER dated September 19, 1979, as evidenced by Section 4.4.1, Smoke Removal, which states that no special smoke exhausting systems are provided at the plant. It further states that when normal ventilation systems cannot be used (for smoke removal), the fire brigade will use the portable ventilation units with flexible ducting available at the plant for smoke removal. The ability to remove smoke and provide ventilation in manual fire fighting situations is important because it can aid the fire brigade in locating the fire source quickly and it can reduce the likelihood of the formation of hot gas layers which can damage exposed safe shutdown cabling in overhead raceways. After the licensee was made aware of the concern, the residents observed the licensee response to additional fire drills and one actual fire on July 9, 2009. The inspectors concluded, based on these observations, that the fire brigade is capable of obtaining the required smoke removal equipment within an acceptable time period.

The inspectors concluded that the failure to provide (smoke removal) brigade equipment in a location where it can be promptly obtained for use in accordance with NFPA 27-1975 was a performance deficiency (PD). The PD was not more than of minor significance because it did not affect the fire brigade's ability to extinguish the fire within the required time. The licensee added this concern to their corrective action program as CR 343486. In response to the identified concern, the licensee purchased three additional smoke removal units which will further improve timely access to the smoke removal equipment throughout the plant and more than doubles their smoke removal capacity. The licensee has also added the use of portable ventilation equipment to their fire brigade training. This URI is closed.

.3 Closed: Unresolved Item (URI) 05000280, 281/2010002-01, Emergency Plan Minimum Staffing

The resident inspectors had previously opened URI 05000280, 281/2010002-01 in NRC Integrated Inspection Report 05000280, 281/2010002 based on maintenance of the required minimum on-site staffing requirements in accordance with the licensee's Emergency Plan. The enforcement aspects of this finding are discussed is Section 4OA7. This URI is closed.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On October 14, 2010 the inspection results were presented to Mr. Sloane and other members of his staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

On September 10, 2010, the lead inspector presented the inspection results to Mr. G. Sloane and other members of his staff. The inspector confirmed that proprietary information was not provided during the inspection.

On September 29, 2010, the lead inspector re-exited with Mr. G. Sloane and other members of the Surry staff via teleconference. The closure of Unresolved Item (URI) 05000280, 281/2010002-01, Emergency Plan Minimum Staffing was discussed

4OA7 Licensee-Identified Violation

The following finding of very low significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section 2.3.2 of the NRC Enforcement Policy, NUREG-1600, for characterization as a Green Non-Cited Violation (NCV).

- 10 CFR 50.54(q) states in part that a licensee authorized to possess and operate a nuclear power reactor shall follow and maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b) and the requirements in appendix E of this part. Contrary to this, between early December 2006 and January 2010, the licensee identified that the staffing was reduced for mechanical maintenance and electrical maintenance personnel on shift to below the minimum shift staffing requirements of the Emergency Plan without a 50.54(q) review. The violation was determined to be of very low safety significance because, the licensee demonstrated non-designated coincidental coverage for the shift staffing positions in question, no degradation of the planning standard existed and the criteria for a white finding was not met. The licensee corrected the deficiency when it was discovered and entered it into the corrective action program as condition report CR364194.

ATTACHMENT: SUPPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Adams, Director, Station Engineering
G. Bischof, Site Vice President
P. Blasioli, Director Nuclear Protection & Emergency Preparedness
E. Collins, Manager Emergency Preparedness
J. Eggart, Manager, Radiation Protection & Chemistry
B. Garber, Supervisor, Licensing
L. Hilbert , Manager Outage and Planning
B. Hoffner, Fleet Emergency Preparedness Manager
R. Johnson, Manager, Operations
C. Olsen, Manager, Site Engineering
K. Sloane, Plant Manager (Nuclear)
M. Smith, Manager Nuclear Oversight
B. Stanley, Director, Station Safety and Licensing
N. Turner, Supervisor Emergency Preparedness
M. Wilda, Supervisor, Auxiliary Systems

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000280/2010-003-00	LER	Loss of Vital Bus Due to Human Error results in Automatic Reactor Trip (Section 4OA3)

Closed

05000280, 281/2009007-02	URI	Availability of Portable Ventilation Fans for Use by the Fire Brigade (Section 4OA5.2)
05000280, 281/2010002-01	URI	Emergency Plan Minimum Staffing (Section 4OA5.3)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment
DWG 11548-FM-068A, Unit 2 Feedwater System
2-OPT-FW-004, Rev. 5; AFW Valve Position Verifications

Section 1R05: Fire Protection
1-FS-FP-200, Rev. 2, Unit 1 High Level Intake Control House Elevation 35FT- 6IN
2-FS-FP-200, Rev. 0, Unit 2 High Level Intake Control House Elevation 35FT- 6IN
0-FS-FP-209, Rev. 1, Intake Vacuum Priming House – Low Level Elevation 37 Feet
0-FS-FP-213, Rev. 0, Intake Structure Transformers – Low Level Elevation 13 Feet
0-FS-FP-211, Rev. 2, Emergency Service Water Pump House - Low Level Elevation 18FT
0-FS-FP-210, Rev. 2, Electrical Equipment Room – Low Level Elevation 12 Feet

Section 1R11: Operability Determination
OP-AA-102, Rev 5; Operability Determination

Section 1R18: Plant Modifications
ET-S-10-0060, Rev. 1; Assembly, Testing, and Installation for 0.22uf and 150 ohm RC filter.
1-PT-1.1, Rev. 36; Nuclear Instrumentation System Trip Channel Test Prior to Startup
IMP-C-NI-19, Rev. 15; Nuclear Instrumentation Maintenance
CAL-048, rev 4, Nuclear Instrument Intermediate Range Drawer
CAL-050, Rev 5; Nuclear Instrument Comparator and Rate Drawer
1-IPT-CC-NI-N42, Rev. 1; Nuclear Instrumentation Power Range N-42 Channel Calibration
0-ECM-1801-01 Rev. 23 OTO1, Westinghouse Type BF-BFD-or-NBFD65NR Relay Replacement
2-PT-8.1, Rev 32 OTO1; Reactor Protection System Logic (For Normal Operations)
Reactor Protection System DWGs 113E244A sh 3 Rev 15, sh 4 Rev 16, Sh 15 Rev 13, sh 16 Rev 8, sh 17 Rev 5, sh 18 Rev 25 sh 16 Rev 19.

Section 1R19: Post-Maintenance Testing
0-OP-ZZ-008, Rev. 9; Assessment of Maintenance Activities for Potential Flooding of Turbine Building and Associate Areas
O-MCM-1003-01, Rev. 24; Expansion Joint Removal, Inspection, and Installation
DWG 11548-FM-071A Rev. 56 Circulating and Service Water System Unit 2
NIC work orders: 38102803832, 38102805711, 38102803844, 38102805749, 38102803730, 38102804478, 38102805735, 38102805766, 38102803742, 38102806124, 38102805502, 38102803648, 38102803551, 38102805517, 38102805469, 38102803662, 38102805556, 38102803609.

Section 1R20: Outage
2-OP-RX-002, Rev. 24; Shutdown Margin (Calculated At Zero Power)
2-OP-RX-004, Rev 22; The Calculation of Estimated Critical Conditions
2-GOP-1.4, Rev. 44; Unit Startup, HSD to 2% Reactor Power
2-GOP-1.5, Rev. 55; Unit 1 reactor Startup 2% reactor Power to Max Allowable Power
2-OP-RX-006, Rev 24; Withdrawal of the Control Banks to Critical Conditions

Section 1EP2: Alert and Notification System Testing

Procedures
Surry Power Station Site-Specific Offsite Radiological Emergency Preparedness Alert and Notification System Quality Assurance Verification
0-LSP-EW-001, Early Warning System Polling Functional Test, Rev. 7
0-LSP-EW-002, Early Warning System Siren Activation Monitoring, Rev. 7

Records and Data
Early Warning System Polling Function Test results from inspection period
Early Warning System Siren Activation Monitoring Test results from inspection period
Emergency Warning System Surry, Telecommunications Operability (quarterly) Testing from inspection period

Section 1EP3: Emergency Preparedness Organization Staffing and Augmentation System

Procedures
DNAP-2605, Emergency Preparedness Performance Indicators, Rev. 10
EPCP-0010, Nuclear Emergency Preparedness Training Program, Rev. 5
EPIP-3.05, Augmentation of Emergency Response Organization, Rev. 6

Records and Data
03/18/2009 Augmentation Capability Assessment - ERO
06/29/2009 Augmentation Capability Assessment - ERO
09/30/2009 Augmentation Capability Assessment - ERO
12/14/2009 Augmentation Capability Assessment - ERO
03/31/2010 Augmentation Capability Assessment - ERO

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Procedures
EP-AA-101, 10 CFR 50.54(q) Change Evaluation, Rev. 2
EPCP-0007, Emergency Preparedness Plan and Procedure Management, Rev. 8
Surry Power Emergency Plan, Rev. 54

Records and Change Packages
EPIP-4.01, Radiological Assessment Director Controlling Procedure, Rev. 24
EPIP-4.03, Dose Assessment Team Controlling Procedure, Rev. 14
EPIP-4.04, Emergency Personnel Radiation Exposure, Rev. 9
EPIP-4.07, Protective Measures, Rev. 13
EPIP-4.21, Evacuation and Remote Assembly Area Monitoring, Rev. 11

Section 1EP5: Correction of Emergency Preparedness Weaknesses

Procedures
PI-AA-200, Corrective Action, Rev. 14
03/18/2009 Self Assessment

Audits and Self-Assessments
SAR000848, Emergency Response Facilities and Equipment, 08/27/09
10-21-S, Surry May 5th Functional Emergency Exercise SMAY10FE
09-03, Emergency Preparedness, 03/10/09
10-02, Emergency Preparedness, 04/22/10

Condition Reports (CRs)
RCE001000 – Errors in Emergency Classifications, Notifications and Protective Action Recommendations
CR 383089, Two individuals on Ops Qual listing for NRC Quals were not included on ERO list
CR 319755, Declining ERO performance
CR 112183, Augmentation initiation error
CR 382661, ERO qualification list discrepancy
CR 381918, ERO qualification list not updated
CR 343823, Confusion about TSC accountability card reader light response
CR 343852, RCS sample issues during ERO graded exercise
CR 343921, Operations shift is not meeting expectations for EP exercise critique
CR 344002, Evaluate the process of tracking total dose
CR 343730, Time critical operation during biennial exercise delayed
CR 344050, Confusion of Rad Protection coverage requirements
CA 144818, No more than 5 minute delay of EOP actions
CR 344051, Process for assessing cross-cutting drill/exercise issues is not formalized
CR 350408, Vender made changes to emergency notification protocol without coordination
CR 352266, Surry EP Group Pagers inadvertently activated
CR 352626, ACE 017640 determined an additional PAR opportunity exceeded 15 minutes
CR 353980, Replacement of ANS engineering design document
CR 366945, Audit 10-02 EP program inconsistency for demo and evaluation of station evacuation
CR 370649, ERO staffing shortfall interim compensatory measures
CR 370898, Compensatory Actions ERF minimum staffing augmentation reduced ERO PI
CR 372760, Dose assessment team performance gaps
CR 378124, Potential applicability of Beaver Valley EP-dose assessment finding to Surry
CR 381021, Expectations for ACA drill ERO performance/response are not being met
CR 386233, ERO Augmentation capabilities for minimum ERO staffing low margin

Section 4OA1: Performance Indicator (PI) Verification

Procedures
EPIP-1.01, Attachment 1, Emergency Action Level Table, Rev 51
EPIP-2.01, Notification of State and Local Governments, Rev. 39

Records and Data

Documentation of Performance Indicator data July 1, 2009, to June 30, 2010, for DEP, ANS, and ERO

Section 4OA7: Licensee-Identified Violation

Memorandum of Understanding Maintenance Work Schedules Surry Power Station
Amendment to Surry Power Station Emergency Plan, December 31, 1980
Letter to Mr. H. Denton, Director NRR, contains revised version of Surry Power Station Emergency Plan, June 30, 1980
Tabulation of hours worked for mechanical and electrical maintenance personnel September 7, 2009 – January 1, 2010

Section 4OA1: Performance Indicator Verification

NEI 99-02, Regulatory Assessment Performance Indicator Guideline.
ER-AA-SPI-1001, Rev. 1, Implementation of the Consolidated Data Entry Reporting for Mitigating System Performance Index

LIST OF ACRONYMS

ADAMS	Agencywide Document Access and Management System
ALARA	As Low As Reasonably Achievable
ANS	Alert and Notification System Testing
CA	Corrective Action
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
DEP	Emergency Response Organization Drill/Exercise Performance
DOT	Department of Transportation
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
ERO	Emergency Response Organization
HP	Health Physics
HPT	Health Physics Technician
HPAP	Health Physics Administrative Procedure
HRA	High Radiation Area
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
JPM	Job Performance Measures
LHSI	Low Head Safety Injection
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OD	Operability Determination
PARS	Publicly Available Records
PCP	Process Control Program
PI	Performance Indicator
PS	Planning Standard
QS	Quench Spray
RAB	Reactor Auxiliary Building
RCE	Root Cause Evaluation
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RFO	Refueling Outage
RP	Radiation Protection
RTP	Rated Thermal Power
RWP	Radiation Work Permit
SDP	Significance Determination Process
SR	Surveillance Requirements
TDAFWP	Turbine Driven Auxiliary Feedwater Pump
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VEPCO	Virginia Electric and Power Company
VHRA	Very High Radiation Area
VPAP	Virginia Power Administrative Procedure
WO	Work Order

Attachment

ALARA	As Low As Reasonably Achievable
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
HP	Health Physics
HPT	Health Physics Technician